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论文

井工开采对露天矿高边坡稳定性影响的研究

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摘要:

以山西平朔安太堡矿露井联合开采为例,通过数值模拟及现场位移监测资料对比分析,探讨了露天矿高边坡在顺坡、逆坡及侧向切坡开采3种情况下的复合应力场和位移场的分布特征及规律。研究表明,边坡内井工开采不利于边坡稳定性,但由于工作面向坡内推进,边坡受采动影响部位的顺序不同,因而对边坡稳定性的影响存在一定的差异。逆坡开采时,随着工作面向坡内推进,边坡前、后期表现出两种完全不同类型的变形位移,前期以倾倒型崩塌破坏为主,后期稳定性有所增强; 顺坡开采时,边坡保安煤柱宽度不断减小,在侧向偏压作用下,边坡将产生沿软弱结构面的推动式剪切滑动; 边坡下切坡开采时,边坡除发生沿软弱结构面的推动式剪切滑动外,还可能发生后缘沿采空裂隙、下部沿软弱层面的张拉滑动变形。

关键词: 露井联合开采,顺坡开采,逆坡开采,侧向切坡开采,边坡稳定性

EFFECT OF UNDERGROUND TUNNEL COAL MINING TO STABILITY OF HIGH OPEN PIT COAL MINING SLOPE

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Abstract:

The high man made slope is at the Antaibao coal mine, where underground tunnel mining and ground open pit mining are carried out at the

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same time. The distribution regularities of the composite stress and displacement field in the slope are analyzed by taking into account the effect of the tunnel mining direction with respect to the above open pit slope. Three tunnel mining excavation directions (i.e., toward, parallel and opposite to the above open pit slope) are examined. The research results indicate that the underground mine is advanced to the stability of slope. However, the excavation direction has some effect to the slope stability. When mining from the opposite direction, the two types of different displacements are represented as the advance of working face. The topping failure is the main form of slope failure in the prophase of mining. The stability of slope is increased in the anaphase. When mining from the toward direction, the width of coal wedge reduces continuously. The slumping shear slide is generated possible. When mining from the parallel direction under the slope, the stretching failure is also generated possible. At the end, the some suggestions are given on the deformation mechanism of slope under the combined mining.

Keywords: Coal mining, Underground, Open pit, Stability analysis, High man made slope

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